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MONEY SUPPLY AND STOCK MARKET PERFORMANCE IN NIGERIA, SOUTH AFRICA AND GHANA[1]

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ABSTRACT: *The study examined the effect of money supply on stock market performance in Nigeria, South Africa and Ghana using data from 1986 to 2018. The data were sourced from World Bank (World Development Indicators 2018), Central Bank of Nigeria Statistical Bulletin 2018, Johannesburg Stock Exchange Market Statistics 2018, and Ghana Stock Exchange Reports (various issues up to 2018). The study employed a simple regression model for each of the studied countries with stock market index as the dependent variable and money supply as the independent variable. Apart from the preliminary tests, Johansen Cointegration Test, Error Correction Model and Granger Causality Test were applied in the study. The results of the analyses revealed the existence of a long-run relationship between money supply and stock market performance in Nigeria, South Africa and Ghana. Also, the results showed a unidirectional causal relationship running from stock market performance to money supply in the three economies studied. As such, the study concluded that it is stock market performance that influences money supply more, rather than money supply affecting stock market performance in Nigeria, South Africa and Ghana. Thus, the study recommended that monetary authorities in Nigeria, South Africa and Ghana should focus their attention more on the effect of stock market performance on money supply in their economy, rather than the effect of money supply on stock market performance.*

KEYWORDS: Money Supply, Stock Market, Cointegration, Error Correction Model, Causality, Nigeria, South Africa and Ghana

JEL CLASSIFICATION: E51, O16

INTRODUCTION

Money supply is the total amount of money available in an economy at a particular time period (Akani &Lucky, 2014). It is the total quantity of currency (coins and notes) in circulation in an economy (country). Bank deposits payable on demand (called demand deposits) are regarded as part of money supply. Therefore, the effective constituents of money supply include currency in circulation and demand deposits. All over the world, money supply is under control

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of central banks. However, the name of the central bank might differ from one country to another. Money supply in Nigeria is controlled by Central Bank of Nigeria (CBN). In South Africa, money supply is under the control of South African Reserve Bank (SARB) which is the central bank in South Africa. In Ghana, Bank of Ghana (BOG) controls money supply as the central bank in Ghana. It is believed that there is a link between money supply and stock market performance.

Stock market performance mirrors the wellbeing of the stock market as a whole or of a specific stock. It is measured by stock market indices which provide information regarding the overall performance of the stock market or a specific sector of the market. Stock market indexes give signal to investors about the future trend in the stock market. Stock market performance is graded well when investors earn good returns on their investments in stocks. However, stock market performance is affected by a wide array of factors; among such factors is money supply. According to Dovern and Welsser (2011), variations in stock prices are in anticipation of variations in money supply. As explained further by Dovern and Welsser (2011), the use of reported data on changes in money supply will induce stock prices that fully reflect new information when published. Barnor (2014) affirmed that most stock analysts in Ghana contend that money supply changes have become a superior indicator and an important source of information about the future of stock market returns or variability. Thus, the questions that arise in the minds of investors and other stakeholders in stock markets are: Does money supply has a long-run or short-run effect on stock market performance? Is the effect of money supply on stock market performance positive or negative? Is the effect of money supply on stock market performance significant at all? What is the direction of causal relationship between money supply and stock market performance? These questions will be addressed in the course of this study. Besides, there is dearth of literature on the subject in South Africa and Ghana. In Nigeria, the few previous studies conducted, such as, Akani and Lucky (2014) and Zubair (2013) are old. As such, the objective of this study is to critically examine the effect of money supply on stock market performance in Nigeria, South Africa and Ghana using current data.

LITERATURE REVIEW

Conceptual Review

Money Supply

Money supply is important because money is used in almost all economic transactions as a medium of exchange, a unit of account and a store of value. An increase in the supply of money happens either through lowering interest rates which stimulates investments; reducing the reserve requirements of banks which allows more money with the banks for lending; embarking on open market operation to boost money in circulation or putting more money in the hands of consumers which spurs more spending. In open market operation, central banks increase money supply by purchasing government securities, such as government bonds or treasury bills. This increases the liquidity in the economy by converting the illiquid securities held by individual investors, commercial banks and other corporate investors into cash. Consequently, the funds become available for lending by commercial banks; available for investment and consumption by other investors.

As a result of the increase in money supply, households spend more on goods and services produced by business firms. Thus, business firms respond to increased sales by increasing production, and the expansion of business activities results in increased demand for labour and capital goods (Schwartz 2019). Consequently, the economy would do better. Schwartz (2019) added that if the money supply continues to expand, prices begin to rise, especially if output growth reaches its capacity limits. As inflation gradually sets in, lenders insist on higher interest rates to make up for an expected decline in purchasing power over the duration of their loans (Schwartz 2019).

On the contrary, central banks could tighten money supply by selling securities on the open market, drawing liquid funds out of the banking system. The prices of such securities fall as supply increases and interest rate rises. On the other hand, when money supply reduces, economic activities decrease, prices fall (deflation).

There are six different measures of money supply. Countries are at liberty to use the one that best fits their domestic economy. Also the contents of each measure of money supply might differ from one country to the other. The known measures of money supply include:

i. M0: This is the narrowest measure of money supply. It includes bank reserves (deposit held by banks and other depository institutions in their account at the central bank) and currency (notes and coins) in circulation (outside the central banks and vaults of depository institutions).

ii. MB: This means monetary base. It is the total currency and the base from which other forms of money are created. It measures the sum of currency in circulation, notes and coins in bank vaults (vault cash) and reserves at the central banks.

iii. M1: This includes currency in circulation, travellers' checks, demand deposits and other checkable deposits which consist primarily of negotiable order of withdrawal accounts at depository institutions and credit union share draft accounts.

iv. M2: This is broader than M1. It is used by most countries as a key economic indicator used in forecasting inflation. M2 includes all the contents of M1 plus savings deposits, time deposits (less than $100,000 in the case of U.S.), money market deposit account for individuals and retail money market mutual funds.

v. M3: It involves M2 plus large (time) and long-term depositsincluding repurchase agreements. However, M3 is not a popular measure of money supply in many countries.

vi. MZM: This means money with zero maturity. It measures the supply of financial assets redeemable at par on demand. MZM includes currency in circulation, traveller's check of non-bank issuers, demand deposits, other checkable deposits, savings deposits and all money market funds. On the other hand, it is M2 plus money market funds minus time deposits. Some countries like U.S believe that it is the most accurate predictor of inflation.

vii. M4: It has all the contents of M3 added to commercial paper.

viii. M5: This consists of M4 in addition to treasury bills.

ix. L: This is the broadest measure of money supply. It involves M4 along with Bankers' Acceptance. L means liquidity.

In Nigeria, the Central Bank defines money supply in two ways: Narrow and broad money (CBN, 2006). Narrow money (M1) is defined to include currency in circulation plus current account deposits with commercial banks. Broad money (M2) measures the total volume of money supply in the economy and is defined as narrow money plus savings and time deposits with banks including foreign denominated deposits. The economy experiences excess money supply when the amount of money in circulation is higher than the level of total output of the economy. When money supply exceeds the level the economy can efficiently absorb, it displaces the stability of the price system, resulting in inflation.

The Central Bank of Nigeria (CBN) could change the level of money supply by adjusting the monetary base (base money). The monetary base consists of currency outside the banking system plus the deposits of banks with the Central Bank. If the central bank observes that there is too much money in circulation and prices are rising or there is potential pressure for prices to rise, it may reduce money supply by reducing the base money (CBN, 2006). To reduce the base money, the Central Bank sells financial assets to banks and the non-bank public so as to decrease the capacity of the deposit money banks to create new money. Also, the CBN can lessen money supply by increasing the Monetary Policy Rate (MPR) which is the rate at which the Central Bank lends to other banks. This monetary policy action would cause banks' lending rates to rise, thereby discouraging investors from borrowing. As a result of the reduced borrowing due to high interest rates, banks' ability to create new money, due to interest charged, is reduced. Alternatively, the CBN can reduce money supply by raising the cash reserve ratio of banks in order to increase their cash reserve deposits with the Central Bank. This action would reduce the deposit balance on banks' balance sheet, thereby reducing their ability to create new money through their lending activities. As a result of investors not having access to new loans, the level of output in the economy drops; unemployment ensued as firms would lay-off staff to cut cost; prices would fall as less money is available for buying goods. Whenever the Central Bank reduces money supply, it implies that contractionary monetary policy is pursued. On the contrary, the Central Bank can increase the supply of money in the economy by reducing the cash reserve ratio, reducing the MPR and/or buying securities from the open market. As a result of the increase in money supply, investors can get loans to expand their production. Consequently, more persons would be employed, the economy would boom and prices would rise.

In South Africa, the Central Bank is called South African Reserve Bank (SABR). It is responsible for the monetary policy of South Africa. Monetary policy refers to the measures taken by monetary authorities to influence the quantity of money and the rate of interest in a country, with a view to achieving stable prices and facilitating full employment and sustainable economic growth. South Africa's monetary policy is conducted within an inflation targeting framework and the refinancing system is the mechanism used by the Bank for the implementation of monetary policy (South African Reserve Bank, 2020).

In Ghana, the Bank of Ghana (BOG) is the Central Bank saddled with the responsibility of monetary policy. Until 1987, the main instruments of monetary management in Ghana were direct controls in the form of ceilings on commercial bank credit to private sector and regulation of interest rates and reserve requirements (Addison, 2001). Then, the BOG determined the money supply growth for a particular year based on economic growth and inflation objectives; determined the credit growth that would be consistent with the money supply growth; distributed the credit growth among banks based on certain criteria and monitor compliance of the banks to the guidelines. Thus, at the beginning of each year, BOG sent out general and

specific policy guidelines (Addison, 2001). However, the instruments currently used by BOG include reserve requirements, open market operation and repurchase agreements (repo, foreign exchange reserve management and foreign exchange swaps or sale and buy back) (Addison, 2001).

Stock Market Performance

Stock market performance shows the wellbeing or otherwise of the stock market as a whole or how well a specific stock is doing in the stock market. Stock market indexes (indices) are used to measure the overall performance of the stock market or the performance of a specific sector. They give signals to the investors about their future investment moves. The movements of the indexes give the idea of the near future trend of the stock market. Stock market performance works as an indicator of the overall health of the economy. Some of the popular world stock market indices include: Dow Jones Industrial Average (DJIA), S&P 500 and NASDAQ-100. Nigeria has Nigeria Stock Exchange All Share Index (NSEASI) and others. Similarly, South Africa has Johannesburg Stock Exchange All Share Index (JSEALSI) among others. Ghana has Ghana Stock Exchange Composite Index among others.

Stock Market Performance is affected by a wide array of factors such as economic, political, global and company-specific issues. Regarding the overall index of performance, the domestic economy's National Income (NI), Gross National Product (GNP) growth, Purchasing Power Parity (PPP), monetary issues, political stability, international relations, Balance of Payment (BOP) issues, etcetera, comes into consideration (East Asia Forum, 2016). But when it zeros down to the specific stocks, then the company specific information such as profitability, sales, profit margin, growth, etcetera, play important role in the price determination of the stock. As such, the stock market might be volatile as stock prices may fluctuate due to the interplay of these factors.

When the stock market index movement shows a positive trend (that is, upward movement), it is explained that the stock market performance is bullish, and the market could be called Bullish Market. Some of the factors which boost up the market are good present or projected economic growth of the economy, positive monetary outlook of the apex bank, decrease in fiscal deficit, good performance of the company in terms of profit, sales, etcetera (East Asia Forum, 2016). But when the general perception of the investors is negative, then the stock market also declines showing a bearish trend, and the market could be described as Bearish Market.

If the performance of an economy is good, then the stock market performance is likely to be good and bullish markets are inevitable. On the other hand, if the economic performances are not up to the mark, then the stock market is most likely to underperform and might see a downward trend (East Asia Forum, 2016). Bullish/bearish market may sustain for weeks or months with temporary rally known as secondary trend (or short term). When bullish/bearish market runs continue for 5 to 20 years with occasional corrections then it is known as Secular Trend (Long Term). Hence, overall economic and stock specific performance influences performance of the market. Thus, Stock Market Performance acts as a barometer of the economy as a whole.

Stock markets increase in performance when investors earn good profits on their investments in stocks. Profits that investors generate from buying and selling of stocks in stock markets are referred to as stock market returns. Returns are usually floating and subject to market risks. To

make the maximum returns, investors should buy low and sell high. Rational investors act on informed decisions and conduct either technical or fundamental analysis to determine the future trend of stocks (Ibenta, 2005). Technical analysis mainly focuses on scrutinizing the historical price movements of a particular stock to predict the future trend of the stock. Fundamental analysis tends to focus more on the cash flows, profit growth of companies and any other announcements that could potentially lead to an increase in the share price of a particular stock.

Theoretical Framework

This study was anchored on the quantity theory of money (QTM) which states that the general price level of goods and services is directly proportional to the amount of money in circulation (money supply). The theory was originally formulated by a Polish mathematician, Nicholaus Copernicus in 1517 and was influentially restated by philosophers, John Lock, David Hume, Jean Bodin and also by economists, Milton Friedman and Anna Schwartz in a book titled "A Monetary History of the United States, 1867-1960 published in 1963. Friedman and Schwartz (1963) used historical time series data and economic analysis to argue the then novel proposition that changes in money supply strongly influenced the United States economy. The inference they drew was that changes in money supply has unintended adverse effects, and that sound monetary policy is necessary for economic stability. In the same vein, Dovern and Welsser (2011) argued that variations in stock prices are in anticipation of variations in money supply.

Empirical Review

Alatiqi and Fazel (2008) examined the causal relationship between money supply and stock prices in USA using monthly data from 1965 to 2005. The study employed Augmented Dickey-Fuller (ADF) test, Eagle-Granger cointegration test and Granger causality test. The results showed that there is no long-term causal relationship from money supply to stock prices. Zubair (2013) studied the causal relationship between stock market index and exchange rate in Nigeria and used money supply as a control variable. Johansen Cointegration and Granger Causality tests were employed as tools of analysis. The study found a unidirectional causality between money supply and All Share Index in Nigeria before the global financial crisis while no causality was observed during the crisis.

However, Akani and Lucky (2014) examined whether there is a long-run as well as causal relationships between money supply and aggregate stock prices in Nigeria from 1980 to 2012. The study employed the Eagle-Granger and Johansen-Joselius method of cointegration in a Vector Error Correction Model. The study found that there exist a long-run relationship between currency in circulation and demand deposit and aggregate stock prices; Time deposit and savings deposit have negative but not significant relationship with aggregate stock prices; while net foreign asset has a negative and significant relationship with aggregate stock prices. The study alsofound a mixed causality between money supply and aggregate stock prices in Nigeria.

Picha (2017) conducted a study on the effect of money supply on the stock market of United States of America. The study covered the period 1952-2015. The tests conducted include ADF, Johansen cointegration and vector error correction model. The study discovered that in the long-run, increase in any of the considered variables leads to advance in S&P 500. In the short-run, deposits and currency variable shows the highest speed of adjustment of all variables

indicating that S&P 500 reacts intensively to changes in money supply. However, equities and treasury bill in the US personal portfolios show moderate speed of adjustment.

Sirucek (2012) explored the impact of money supply on stock prices and stock bubbles by using ADF test, cointegration test, Granger Causality test and OLS regression. The study covered the period 1967-2011. The study found that money supply measured by M2 monetary aggregate is not a significant factor in the development of the speculative bubble of 2007. Ahmed (2011) examined the long-run relationship between money supply and selected macroeconomic factors in Sudan and established causality between money supply and macroeconomic variables. The study used a Granger causality test to establish the causality. The study concluded that money supply variability has a significant influence on expected stock market returns.

Maskay (2007) examined the effect of changes in money supply on stock prices of United States of America using data spanning 1st quarter of 1959 to 2nd quarter of 2006. Two-stage regression analysis was used. The study found that when money supply increases, S&P 500 (proxy for stock price) increases too.

Olulu-Briggs and Ogbulu (2015) examined the impact of Broad Money supply (M2) on Asset prices in Nigeria using monthly data in logarithm form for the period ranging from 2008M1 to 2012M12. The Unit Root test results showed that the variables were stationary after being first differenced; at 5% significance level. The results of Johansen Cointegration test gave evidence of one cointegrating equation which explains that a long-run equilibrium relationship exist between Stock Market Capitalisation and Broad Money Supply. The Vector Error Correction Model was used to analyze short-run adjustment dynamics and showed -0.08% speed of adjustment of prior deviations from equilibrium.The Granger Causality test demonstrated a unidirectional causality from Broad Money Supply to Stock Market Capitalisation.

METHODOLOGY

The study employed ex post facto research design as it made use of time series data on money supply and stock market indexes of Nigeria, South Africa and Ghana from 1986 to 2018. The data were collected from World Bank (World Development Indicators 2018), Central Bank of Nigeria Statistical Bulletin 2018, Johannesburg Stock Exchange Market Statistics 2018 and Ghana Stock Exchange Reports (various issues up to 2018). The study used three bivariate models; one model for each of the studied countries as specified below:

Model 1: Model for Nigeria

$$NSEASI = \beta_0 + \beta_1 MS_t + \mu$$

Model 2: Model for South Africa

$$JSEALSI = \beta_0 + \beta_1 MS_t + \mu$$

Model 3: Model for Ghana

$$GSECI = \beta_0 + \beta_1 MS_t + \mu$$

Where:

NSEASI = Nigeria Stock Exchange All Share Index

JSEALSI = Johannesburg Stock Exchange All Share Index

GSECI = Ghana Stock Exchange Composite Index

MS = Money Supply

β_0 - β_1 = Coefficients

t = Time

μ = Error Term

Augmented Dickey-Fuller (ADF) test was employed in determining the stationarity of the variables. Johansen Cointegration Test was used to ascertain the existence or otherwise of a long-run relationship between money supply and the respective stock market index.Vector Error Correction (VEC) Estimates provided the short-run effect of the independent variable on the dependent variable and the speed of adjustment towards equilibrium. VEC Residual Serial Correlation Test was employed to detect the presence or otherwise of autocorrelation. VEC Heteroskedasticity Test was used to determine if the residuals have constant variance or not. Granger Causality Test was used to determine the existence/direction of causal relationships between the variables.

RESULTS OF ANALYSES AND DISCUSSION

Table 1: Stationarity (Unit Root) Test Results for Nigeria, South Africa and Ghana

Variable	Augmented Dickey-Fuller (ADF) Test Statistic	1% Level Critical Value	5% Level Critical Value	10% Level Critical Value	Order of Integration	Prob. *	Durbin-Watson Statistic
Nigeria							
Money Supply	-9.199608	-3.670170	-2.963972	-2.621007	I(1)	0.0000	2.259612
NSEASI	-5.710911	-3.670170	-2.963972	-2.621007	I(1)	0.0001	1.925889
South Africa							
Money Supply	-5.422605	-3.679322	-2.967767	-2.622989	I(1)	0.0001	2.061584
JSEALSI	-3.439705	-3.661661	-2.960411	-2.619160	I(1)	0.0170	2.004974
Ghana							
Money Supply	-6.551653	-3.670170	-2.963972	-2.621007	I(1)	0.0000	1.969857
GSECI	-3.179766	-3.752946	-2.998064	-2.638752	I(1)	0.0345	1.924977

Source: Computed by the authors using E-Views 9

Table 1(Unit Root Test Results) indicates that all the variables (money supply for Nigeria, South Africa and Ghana; Nigeria stock exchange all share index, Johannesburg stock exchange all share index and Ghana Stock exchange composite index) are stationary at first difference, implying that they have a unit root. As such, Johansen Cointegration test and Vector Error Correction Model were the appropriate techniques of analysis adopted.

Table 2: Johansen Cointegration Test Results for Nigeria, South Africa and Ghana

Null Hypothesis: No Cointegration						
	Nigeria		**South Africa**		**Ghana**	
Trace Test						
HypothesizedNo. of CE(s)	None	At most 1	None	At most 1	None	At most 1
Eigenvalue	0.615286	0.035002	0.346172	0.120565	0.852626	0.044164
Trace Statistic	29.72656	1.068878	16.60159	3.854266	50.95873	1.174385
0.05 Critical Value	15.49471	3.841466	15.49471	3.841466	15.49471	3.841466
Prob.**	0.0002	0.3012	0.0339	0.0496	0.0000	0.2785
	Trace test indicates 1 cointegrating eqn(s) at the 0.05 level		Trace test indicates 2 cointegrating eqn(s) at the 0.05 level		Trace test indicates 1 cointegrating eqn(s) at the 0.05 level	
Maximum Eigenvalue Test						
Hypothesized No. of CE(s)	None	At most 1	None	At most 1	None	At most 1
Eigenvalue	0.615286	0.035002	0.346172	0.120565	0.852626	0.044164
Max-Eigen Statistic	28.65768	1.068878	12.74733	3.854266	49.78434	1.174385
0.05 Critical Value	14.26460	3.841466	14.26460	3.841466	14.26460	3.841466
Prob.**	0.0002	0.3012	0.0856	0.0496	0.0000	0.2785
	Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level		Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level		Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level	

Source: Computed by the authors using E-Views 9

The Johansen cointegration test results for Nigeria, South Africa and Ghana presented in Table 2 showed that the variables are cointegrated. As such, Trace test indicated 1 cointegrating equation for Nigeria; 2 cointegrating equations for South Africa and 1 cointegrating equation for Ghana. Similarly, Max-eigen value test indicated 1 cointegrating equation for Nigeria, South Africa and Ghana. All cointegrating equations were significant at 5% level, signalling the presence of long-run relationships between the variables (dependent and independent).

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Table 3: Vector Error Correction Estimates for Nigeria, South Africa and Ghana

Nigeria Dependent variable: D(NSEASI)			**South Africa** Dependent variable: D(JSEALSI)			**Ghana** Dependent variable: D(GSECI)		
Variable	**Coefficient**	**t-statistic**	**Variable**	**Coefficient**	**t-statistic**	**Variable**	**Coefficient**	**t-statistic**
D(MS (-1)	1.061565	0.70656	D(MS(-1)	-17.07325	-5.35832	D(MS(-1)	3.655652	0.52363
C	-1797.259	-	C	12.44378	-	C	-102.8197	-
ECT	-0.964824	-5.22984	ECT	-0.835374	-1.81197	ECT	-0.485559	-0.67117
R-squared = 0.485371 Adjusted R-squared = 0.467625 F-statistic = 27.35128			R-squared = 0.351751 Adjusted R-squared = 0.210827 F-statistic = 2.496037			R-squared = 0.761634 Adjusted R-squared = 0.698906 F-statistic = 12.14186		

Source: Computed by the authors using E-Views 9

Table 3 presents the Vector Error Correction Estimates for Nigeria, South Africa and Ghana. The result for Nigeria showed that money supply has a positive effect on Nigeria stock exchange all share index (NSEASI). However, the t-statistic of 0.71 which is lower than the critical value of 1.96 indicates that the result is not significant at 0.05 level. The Error Correction Term (ECT) for Nigeria showed that 0.97% of disequilibrium was corrected. The R-squared indicated that money supply accounts for 48.54% of the changes in NSEASI, while Adjusted R-squared signalled that money supply accounts for 46.76% of the changes in NSEASI. The F-statistic of 27.35 is higher than the critical value of 3.34 at 5% level of significance, implying that the regression result for Nigeria is significant.

The result for South Africa indicated that money supply has a negative effect on Johannesburg stock exchange all share index (JSEALSI). The result is significant as the t-statistic of -5.36 (regarded as 5.36 as the negative sign is only there to show that the effect is negative) is higher than the critical value of 1.96 at 0.05 level of significance. The ECT for South Africa signalled a high speed of adjustment (of 83.54%) to equilibrium. The R-squared signified that money supply causes 35% of the changes in JSEALSI. Similarly, Adjusted R-squared affirmed that only 21% of the changes in GSECI are accounted-for by money supply. The F-Statistic of 2.50 is higher than the critical value of 2.41, meaning that the regression result is significant.

The result for Ghana points to the fact that money supply has a positive effect on Ghana stock exchange composite index (GSECI), though the result is not significant as the critical value of 1.96 at 5% level of significance is higher than the t-statistic of 0.52. The ECT of -0.49 signalled a moderate speed of correction to equilibrium. The R-squared showed that money supply is responsible for 76.16% of the variations in GSECI. The Adjusted R-squared supported that money supply is responsible for 69.89% of the variations in GSECI. The overall regression result for Ghana is significant as the F-statistic of 12.14 is higher that the critical value of 5.80 at 5% level of significance.

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Table 4: VEC Residual Serial Correlation LM Test Results for Nigeria, South Africa and Ghana

	Nigeria		South Africa		Ghana	
	Null Hypothesis: no serial correlation at lag order h					
Lags	**LM-Stat**	**Prob**	**LM-Stat**	**Prob**	**LM-Stat**	**Prob**
1	16.91875	0.0020	1.914050	0.7516	14.80676	0.0051
2	11.45662	0.0219	4.948228	0.2927	13.37235	0.0096
3	2.725437	0.6048	1.180279	0.8813	10.45407	0.0334
4					2.970516	0.5628
	Probs from chi-square with 4 df.		Probs from chi-square with 4 df.		Probs from chi-square with 4 df.	

Source: Computed by the authors using E-Views 9

Table 4 presents the serial correlation (autocorrelation) test for Nigeria, South Africa and Ghana. The result for Nigeria indicated no autocorrelation at lag 3 as the probability value of LM-Statistic is higher than 0.05. The result for South Africa showed no evidence of serial correlation as the prob. of LM-stat is higher than 0.05. The resultfor Ghana indicated no evidence of serial correlation at lag 5. Thus, the null hypothesis of no serial correlation was accepted for the three economies.

Table 5: VECHeteroskedasticity Test Results for Nigeria, South Africa and Ghana

Nigeria			South Africa			Ghana		
Joint test								
Chi-sq	**Df**	**Prob.**	**Chi-sq**	**Df**	**Prob.**	**Chi-sq**	**Df**	**Prob.**
1.097163	6	0.9817	39.94313	30	0.1060	73.37925	60	0.1149

Source: Computed by the authors using E-Views 9

The results of Heteroskedasticity test for Nigeria, South Africa and Ghana shown in Table 5 indicated that the error terms for the three countries have a constant variance as their Chi-square probability values are higher than 0.05, implying that there is homoskedasticity.

Table 6: Pairwise Granger Causality Test Results for Nigeria, South Africa and Ghana

Null Hypothesis	**Obs**	**F-Statistic**	**Prob.**
Nigeria			
D(MS) does not Granger Cause D(NSEASI) D(NSEASI) does not Granger Cause D(MS)	29	1.87616 3.11003	0.1631 0.0471
South Africa			
D(MS) does not Granger Cause D(JSEALSI) D(JSEALSI) does not Granger Cause D(MS)	31	0.01125 4.46356	0.9163 0.0437
Ghana			
D(MS) does not Granger Cause D(GSECI) D(GSECI) does not Granger Cause D(MS)	26	1.61401 7.94150	0.2228 0.0027

Source: Computed by the authors using E-Views 9

Table 6 presents the results of Granger causality test for Nigeria, South Africa and Ghana. The result for Nigeria indicated a unidirectional causal relationship running from Nigeria stock exchange all share index (NSEASI) to money supply (MS). Similarly, in South Africa, a unidirectional causal relationship runs from Johannesburg stock exchange all share index (JSEALSI) to money supply. Also, in Ghana, a unidirectional causality runs from Ghana stock exchange composite index (GSECI) to money supply.

DISCUSSION OF FINDINGS AND ADDRESSING OF RESEARCH QUESTIONS

The results of the study revealed that there is a long-run relationship between money supply and stock market performance in Nigeria, South Africa and Ghana. The findings of this study agrees with the study of Akani and Lucky (2014), Alatiqi and Fazel (2008) and Olulu-Briggs and Ogbulu (2015) who found a long-run relationship between money supply and stock market performance. This result addressed the first research question: Does money supply have a long-run or a short-run effect on stock market performance?

The findings of this study further revealed that money supply has a positive but not significant effect on stock market performance in Nigeria and Ghana. However, the result for South Africa indicated a negative and significant effect of money supply on stock market performance.Thus, these findings of the study answered the second research question: Is the effect of money supply on stock market performance positive or negative? Also, the results answered the third question: Is the effect of money supply on stock market performance significant at all? The finding for Nigeria and Ghana is in line with the results of Sirucek (2012) who found that money supply does not have a significant impact on stock prices. However, Akani and Lucky (2014) found that time deposit and savings deposit have a negative but not significant relationship with aggregate stock prices.

The results of this study further revealed a unidirectional causal relationships running from the stock market indices in Nigeria, South Africa and Ghana to money supply. This is a unique scenario as the same direction of causality is observed in the three studied economies. In Nigeria, the causal relationship runs from Nigeria stock exchange all share index to money supply; In South Africa, the causality runs from Johannesburg stock exchange all share index to money supply and in Ghana, the causal relationship runs from Ghana stock exchange composite index to money supply. This result answered the fourth question: What is the direction of causal relationship between money supply and stock market performance? However, Zubair (2013) found a unidirectional causality between money supply and all share index in Nigeria. On the contrary, Akani and Lucky (2014) found a mixed causal relationship between money supply and aggregate stock prices in Nigeria.

CONCLUSION AND RECOMMENDATIONS

The findings of the study revealed that money supply has a long-run relationship with stock market performance in Nigeria, South Africa and Ghana. Also, causal relationships were established in the three economies; running from stock market indexes of the three economies to money supply of the economies respectively. In Nigeria, a unidirectional causal relationship runs from Nigeria stock exchange all share index to money supply. Also, in South Africa, a

unidirectional causality runs from Johannesburg stock exchange all share index to money supply. Furthermore, in Ghana, a causal relationship runs from Ghana stock exchange composite index to money supply. In conclusion, it is stock market performance that influences money supply more, rather than money supply affecting stock market performance in Nigeria, South Africa and Ghana.

Thus, the study recommended that the monetary authorities in Nigeria, South Africa and Ghana should focus their attention more on the effect of stock market performance on money supply in their economy, rather than the effect of money supply on stock market performance.

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